

TRAGUS ROXBURGHII (POACEAE: ZOYSIEAE)
NEW TO THE NEW WORLD

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ABSTRACT

Tragus roxburghii Panigr. has recently been identified from a herbarium specimen from the Dominican Republic. This represents the first record of this species in the New World. Four species of *Tragus* are now known to have been introduced into the New World. A key to separate these species is provided, with a description of *T. roxburghii* and its distribution in the New World.

Tragus Haller is a tropical and subtropical genus usually found in disturbed areas and there are seven species recognized worldwide (Clayton and Richardson 1972; Clayton and Renvoize 1986). The genus is recognized by the disarticulation of the spikelets and the short primary branch as one unit, awnless spikelets, minute or absent first glume, and distinct trichomes in longitudinal rows on the second glume, usually overlying the veins. All of the species known in the Americas have been introduced (Anton 1981).

Prior to this report, three species of *Tragus* were known to occur in the New World. *Tragus berteronianus* Schultes occurs in North America, predominately the southwestern U.S. and Mexico, and the West Indies; *T. racemosus* (L.) Allioni occurs sporadically in North America, predominately the southwestern U.S.; and *T. australianus* S.T. Blake which is reported from dry places in Central Argentina (Anton 1981) from the Provinces of La Rioja (*Kurtz 12705*, CORD, K) and San Luis (*A.T. Hunziker 16334*, CORD, K).

Tragus roxburghii Panigr. is the fourth species of this genus to be introduced into the New World. It is found in India, Indochina, China and East Tropical Africa (Anton 1981). This new record was discovered while examining specimens at TAES from the Dominican Republic. The specimen was originally identified as *T. berteronianus*, but I identified it as *T. roxburghii* and verified it with specimens at TAES and US. Specimens were also borrowed from JBSD to determine if other collections had been made.

Tragus roxburghii has long been referred to as *T. biflorus* (Roxburgh) Schultes, which is a superfluous name. Panigrahi (1974) gives a detailed account of the nomenclature history for this taxa and why a new name had to be provided. Since,

as a result of Panigrahi's study, the authorities of the synonyms are to be cited differently; a brief account of the nomenclatural history is provided.

Tragus biflorus is based on *Lappago biflora*, which was described by Roxburgh in 1820. In addition to the description there is an unpublished illustration of *L. biflora* in the Kew collections [Roxb. Ic. No. 780; CAL, K (Sealy 1956)]. This illustration could have been considered the type if Roxburgh had not cited *Phalaris muricata* Forssk., described in 1775, as a direct nomenclatural synonym. This makes *Lappago biflora* a superfluous name for *Phalaris muricata* Forssk. and the type for *P. muricata* must also be treated as the type of *Lappago biflora* (1988 International Code of Botanical Nomenclature, Art. 7.13), since Roxburgh did not clearly indicate a different type. *Lappago biflora* was described from material from the Coromandel Coast of India, but the type for *Phalaris muricata* is from the Sea of Marmora in Turkey and *Tragus biflorus* has not been reported from this type locality. The type for *Phalaris muricata* has not been found in Forsskal's Herbarium at Copenhagen and the description given by Forsskal could be referable to *Tragus biflorus* or to a poorly observed, depauperate specimen of *T. racemosus*, which is found in Turkey. Thus, Panigrahi (1974) stated that *Phalaris muricata*, at best, should be treated as a synonym of *Tragus racemosus*, and at worst as a name of uncertain application.

Also, the combination *T. muricatus* is already occupied by a name proposed by Moench in 1794, in which Moench cited *Cenchrus racemosus* L. as a direct synonym. This makes *Tragus muricatus* Moench a superfluous name for *T. racemosus* (L.) All.

Schultes in 1824 based his name combination, *T. biflorus*, on *Lappago biflora* Roxb., but still included *Phalaris muricata* as a synonym. Since the basionym, *Lappago biflora* is illegitimate and *Tragus muricatus* is already occupied, this is a legitimate nomen novem. Because Schultes cited *Phalaris muricata* as a synonym, *Tragus biflorus* is actually based on the type of *Phalaris muricata*, and thus belongs to the to the taxon referable as *Tragus racemosus* and not Roxborough's *Lappago biflora*. Consequently, a new name was necessary and provided by Panigrahi (1974). For a more in depth discussion of this complex nomenclatural history see Panigrahi (1974).

A key to the known species of *Tragus* in the New World, along with some spikelet illustrations and a description of *T. roxburghii* are provided. Mature spikelets should be examined when using the key.

KEY TO THE NEW WORLD SPECIES OF *TRAGUS*

1. Second glume 7-veined; clusters of 3 – 6 spikelets *T. racemosus*
1. Second glume 5-veined; clusters of 2 spikelets (rarely 3) 2
 2. The length of the primary branch to the first spikelet is as long as or shorter than the distance between the first and second spikelet (Fig. 1-A); second spikelets 1.8–3(4.0) mm long; the primary branch sometimes extends past the second spikelet *T. berteronianus*

2. The length of the primary branch to the first spikelet is longer (up to two times) than the distance between the first and second spikelet (Figs. 1-B and 1-C); second spikelets 3.0 – 4.5 mm long; the primary branch rarely extending past the second spikelet 3
3. Spikelets of a cluster separated by a distinct internode, (0.2)0.3 – 0.6 mm long (Fig. 1-B); trichomes on second glume of mature spikelets bulbous or thickened at base; inflorescences (2.5)5.0 – 9.0 cm long; leaf blades 3 – 6 mm wide *T. australianus*
3. Spikelets of a cluster not separated by a distinct internode, 0 – 0.2 mm long, but are attached at more or less the same point on the primary branch (Fig. 1-C); trichomes on second glume of mature spikelets not bulbous or thickened at base, but are slender for their entire length; inflorescences 1 – 5 cm long; leaf blades 2 – 3(4) mm wide *T. roxburghii*

Tragus roxburghii Panigr., *Kew Bull.* 29(3):496 (1974).—TYPE: INDIA. TAMIL NADU (Madras): Vela Cherry, Jul 1845, *G. Thomson s.n.* (HOLOTYPE: K). Note: The specimen is labelled '*Lappago biflora*.'

Lappago biflora sensu Roxb., *Hort. Bengal.*:82 (1814), nomen nudum.

Lappago biflora sensu Roxb., *Fl. Ind.*, ed. Carey & Wall. 1:284 (1820), quoad descript., excl. typo.

Tragus biflorus sensu Schultes, *Mant. Syst. Veg.* 2:205 (1824), nomen novum. Based on *Lappago biflora* sensu Roxburgh.

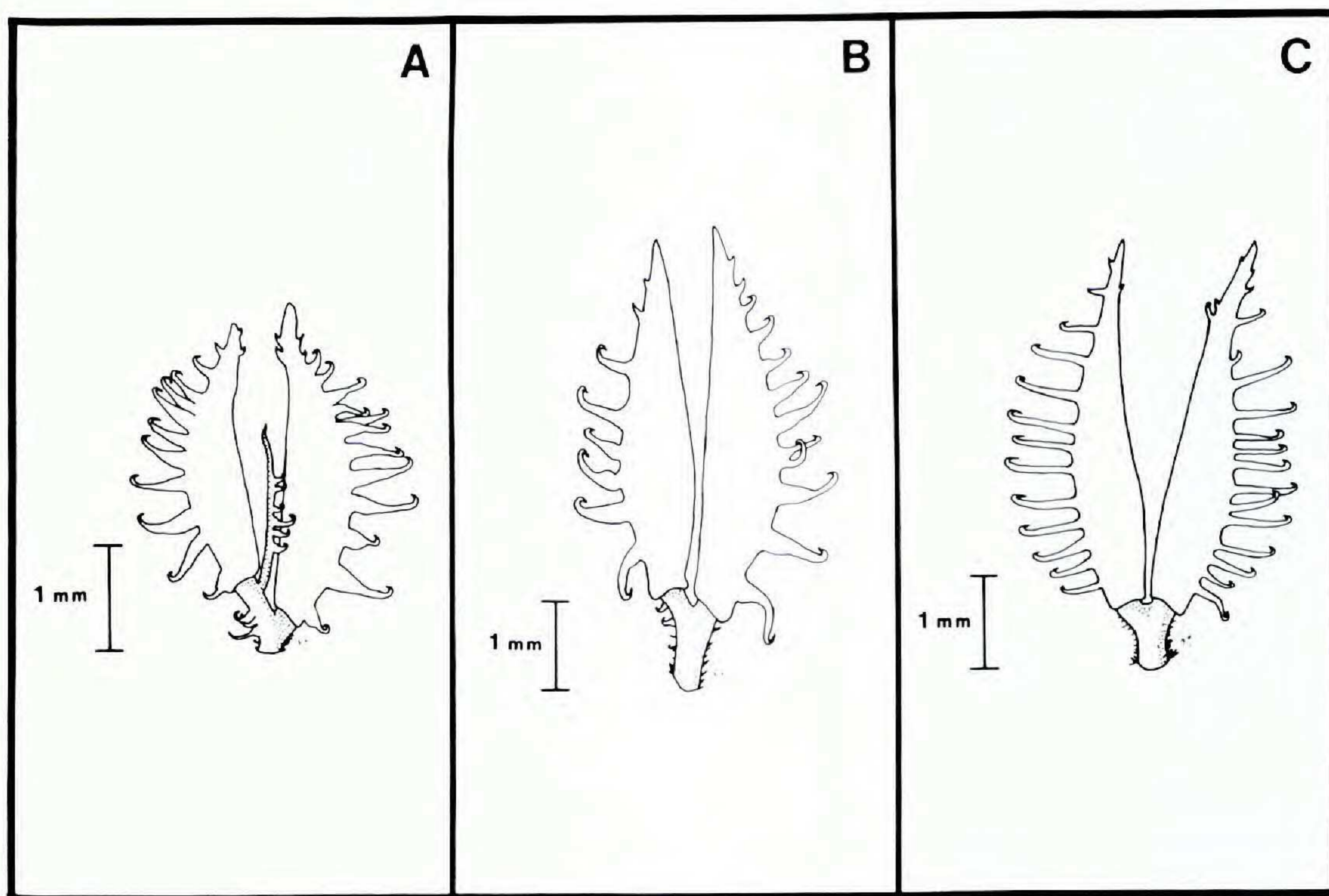


FIG. 1. Diagrammatic illustrations of three *Tragus* species. (A) *T. berteronianus*; (B) *T. australianus*; (C) *T. roxburghii*.

Annual, culms 5.0 – 11.0 (14.0) cm tall, usually spreading; leaf blades 0.5 – 3.0(5.0) cm long and 1.0 – 3.0(4.0) mm wide. *Inflorescence* 1.0 – 5.0 cm long; two spikelets per cluster; 8 – 13(22) clusters per inflorescence; primary branch not extending past the second spikelet; primary branch 0.5 – 0.9 mm long; length of the primary branch to the first spikelet (0.4 – 0.7 mm long) is longer (up to two times) than the internode length between the first and second spikelet (Fig. 1-C); spikelets of cluster not separated by a distinct internode, but attached at more or less the same point on the primary branch. Internode between spikelets 0 – 0.2 mm long. *Spikelets* 3.0 – 4.5 mm long; upper spikelet about same size as first spikelet; *first glume* 0.2 – 0.3 mm long, veinless, membranous; *second glume* 3.0 – 4.5 mm long, 5-veined, trichomes 0.5 – 1.4 mm long, in longitudinal rows (usually over veins) not bulbous or thickened at base, but are slender for their entire length. *Lemma* 2.0 – 2.6 mm long, 3-veined. *Palea* 1.8 – 2.3 mm long, membranous. *Anthers* 0.4 – 0.6 mm long. *Caryopsis* 1.3 – 1.7 mm long, 0.5 – 0.6 mm wide.

Specimens examined from the New World: DOMINICAN REPUBLIC. **Province of Peravia:** 8.5 km Oeste de Bani en la carretera a Azuai: cerca de Galeon (de Bani) bosque xerofito y espinosa de *Acacia*, *Calliandra*, *Prosopis* y Cactaceae, 18° 19'N, 70° 24'O, alt. 100 pies., 18 Nov 1981, Zanoni 18074, Mejia & Pimentel (JBSD, TAES); Las Tablas 15 km de Bani; Proyecto Caprino location de Secretaría de Estado de Agricultura, dry forest with Cactaceae, on sandy soil, with goats grazing, 18° 18'N, 70° 24'W. 1979 and 1980, Jansen s.n. (JBSD). NOTE: Mixed sheet: *T. roxburghii* on left and *T. berteronianus* on right and in the fragment packet.

The examination of additional specimens of *Tragus* from the New World, especially from the West Indies, will probably produce further records of this taxon.

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